

Notice of Allowability

Application No.

09/804,792

Examiner

Tran N. Nguyen

Applicant(s)

JINUPUN, PORAMASTE

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to 8/27/03.
2. ☒ The allowed claim(s) is/are 24-50.
3. ☒ The drawings filed on 14 March 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
(a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No. _____.
(b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
(c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

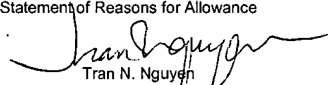
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- 1 ☒ Notice of References Cited (PTO-892)
2 ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3 ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No. _____
4 ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material

- 5 ☐ Notice of Informal Patent Application (PTO-152)
6 ☐ Interview Summary (PTO-413), Paper No. _____.
7 ☒ Examiner's Amendment/Comment
8 ☒ Examiner's Statement of Reasons for Allowance
9 ☐ Other


Tran N. Nguyen
Primary Examiner
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DETAILED ACTION

Drawings

The Objection to the drawings under 37 CFR 1.83(a) is hereby withdrawn. The Examiner concurs that applicant's amendment filed 9/2/03 with explanation about the drawings have provided clarification.

Examiner's Amendment

1. An Examiner's Amendment to the record appears below. Should the changes and/or additions be unacceptable to applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it must be submitted no later than the payment of the Issue Fee.

Please change the following:

In the claim: **Cancel claims 1-23. Add the following claims:**

Claim 24. A polyphase reluctance machine comprising:

a first and second magnetic circuit assemblies arranged for relatively movement;
said first magnetic assembly having a plurality of first salient poles
said second magnetic assembly having a plurality of second salient poles;
wherein
widths of said first and second salient poles being substantially equal; and,
only said plurality of first salient poles carrying windings, each of said first salient poles of said first assembly is subdivided into plural teeth;
the windings for each of said first salient poles being mounted on either each of said teeth or on alternate teeth thereof, and all said windings of said teeth of each of said first salient poles being connected together to be one phase winding such that, when excited, a phase winding of each pole forms electromagnetic poles of same polarity, each wound tooth being arranged, when

in use, generating left and right circular flux loops such that a rotational direction of flux loop linkings to portions of on of a right loop and a left flux loop of respective adjacent wound teeth to be the same, and said flux loop linkings joining together as a series of circular flux loops, and an arrangement of said first and said second magnetic assemblies such that, when said machine being in used, at a position of a pole corner of said second salient poles of said second magnetic assembly is in alignment with said first salient poles of said first magnetic assembly, a flux loop produces a reluctance torque to move said salient poles, wherein said pole-corner of the second assembly being sequentially increasingly aligned with the pole of the first assembly by subsequent flux loops producing reluctance torque to continue move until said first and said second salient poles of said first and second assemblies are fully aligned.

Claim 25. Said polyphase reluctance machine as claimed in claim 24 constructed as a non-overlap-pole machine, wherein said first salient pole of an adjacent phase and the first salient pole of a present phase have their respective wound teeth arranged such that respective end flux loops of each series of flux loops are in the same rotation direction at said first salient poles that joint between phases.

Claim 26. Said polyphase reluctance machine as claimed in claim 24 constructed as an overlap-pole machine such that the winding poles of plural phases are in part overlapped, wherein respective series of flux loops of each overlapping pole section are in the same rotation direction.

Claim 27. Said polyphase reluctance machine as claimed in claim 24, said first magnetic assembly comprises a stator.

Claim 28. Said polyphase reluctance machine as claimed in any of claim 24, wherein the first magnetic assembly comprises a rotor.

Claim 29. Said polyphase reluctance machine as claimed in claim 27 or claim 28 wherein, when said machine being in use, the windings in each slot are driven by current inversely direction to windings in adjacent slots.

Claim 30. Said polyphase reluctance machine as claimed in claim 27, wherein said windings of the plural teeth of each of said first salient poles are connected together to be one phase winding, said one-phase windings being connected in parallel.

Claim 31. Said polyphase reluctance machine as claimed in claim 27, wherein said windings of the plural teeth of each of said first salient poles are connected together to be one phase winding, said one-phase windings being connected in series.

Claim 32. Said polyphase reluctance machine as claimed in claims 30 or 31 wherein windings of adjacent teeth of each of said first salient poles being wound inversely direction to each other.

Claim 33. Said polyphase reluctance machine as claimed in claims 30 or 31 wherein only odd teeth of each of said first salient poles, being wound by windings, and said odd teeth being wound in the same direction.

Claim 34. Said polyphase reluctance machine as claimed in claims 30 or 31, wherein only even teeth of each of said first salient poles, being wound by windings, and said odd teeth being wound in the same direction.

Claim 35. Said polyphase reluctance machine as claimed in claim 27 or claim 28 wherein said teeth being virtual teeth, said virtual teeth is defined by a configuration of said first salient poles to form tooth-less salient poles, wherein position of the winding on the first magnetic assembly being maintained so as to effect each of the virtual teeth for flux traveling between the first salient poles and the second salient poles.

Claim 36. Said polyphase reluctance machine as claimed in claim 25, said first magnetic assembly comprises a stator.

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Claim 37. Said polyphase reluctance machine as claimed in any of claim 25, wherein the first magnetic assembly comprises a rotor.

Claim 38. Said polyphase reluctance machine as claimed in claim 36 or 37, wherein said machine being a direct-current pulse polyphase reluctance machine comprising at least two second salient poles, a predetermined number of phases and each of said first salient poles having an even number of teeth, said direct current pulse polyphase reluctance machine having parameters:

(a) a total number of first salient poles is equal to a product of a number of second salient poles multiplied by the predetermined number of phases; and,

(b) a total number of teeth equals a product of a number of toothed-poles of said first salient poles multiplied by a number of said teeth per said first poles.

Claim 39. Said polyphase reluctance machine as claimed in claim 36 or 37, wherein said machine being a direct-current pulse polyphase reluctance machine comprising an even number of said second salient poles and each of said first salient poles having at least two teeth thereof, and a predetermined number of phase, said direct current pulse polyphase reluctance machine having parameters:

(a) a total number of first salient poles is equal to a product of a number of second salient poles multiplied by the predetermined number of phases; and,

(b) a total number of teeth equals a product of a number of toothed-poles of said first salient poles multiplied by a number of said teeth per said first poles.

Claim 40. Said polyphase reluctance machine as claimed in claim 38 or 39 having three phases, the machine parameters including :

a stroke angle of the machine equals 360 divided by $2/3$ of a total number of first magnetic assembly poles.

Claim 41. Said polyphase reluctance machine as claimed in claim 26, said first magnetic assembly comprises a stator.

Claim 42. Said polyphase reluctance machine as claimed in any of claim 26, wherein the first magnetic assembly comprises a rotor.

Claim 43. Said polyphase reluctance machine as claimed in claim 41 or 42 comprising a direct current pulse machine comprising at least two second salient poles, a predetermined number of phases and each of said first salient poles having an even number of teeth, said direct current pulse polyphase reluctance machine having parameters:

(a) a total number of first salient poles is equal to a product of a number of second salient poles multiplied by the predetermined number of phases; and,

(b) a total number of teeth equals a product of a number of toothed-poles of said first salient poles multiplied by a number of said teeth per said first poles.

Claim 44. Said polyphase reluctance machine as claimed in claim 43, wherein said predetermined number of phases is three and the machine parameters including :
the total number of teeth equal $\frac{2}{3}$ of the total number of stator poles times
the number of teeth per pole; and the stroke angle of the machine equals 360 degrees divided by $\frac{2}{3}$ of the total number of first magnetic assembly poles.

Claim 45. Said polyphase reluctance machine as claimed in claim 41 or 42 being a direct-current pulse polyphase reluctance machine comprising an even number of said second salient poles and each of said first salient poles having at least two teeth thereof, and a predetermined number of phase, said direct current pulse polyphase reluctance machine having parameters:

(a) a total number of first salient poles is equal to a product of a number of second salient poles multiplied by the predetermined number of phases; and,

(b) a number of teeth of each said first salient pole divided by a number of phases is an integer, every winding pole having the phase winding inverted with respect to each adjacent pole to generate series of flux loops rotation direction in accordance with alternating current to eliminate cancellation of the series of flux loops.

Claim 46. Said polyphase reluctance machine as claimed in claim 45 having a three phases, the machine parameters including : a total number of teeth equals $\frac{2}{3}$ of a total number of said first salient poles multiplies a number of teeth per pole; and a stroke angle of the machine equal 360 degrees divided by $\frac{2}{3}$ of the a number of first salient poles.

Claim 47. Said polyphase reluctance machine as claimed in any of claims 38 to 46 where in order to achieve low torque ripple the winding is optimized to provide for a high number of teeth.

Claim 48. Said polyphase reluctance machine as claimed in any of claims 38 to 46 comprising a linear motor.

Claim 49. Said polyphase reluctance machine as claimed in claim 27 where the rotor core comprises a light weight material.

Claim 50. Said polyphase reluctance machine as claimed in claim 27 where the rotor core comprises hollowed out.

The above Examiner's amendment to resolve several issues of indefinite claimed language, and improper dependencies of claims or improper multiple dependencies of claims. **Should the changes and/or additions be unacceptable to applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it must be submitted no later than the payment of the Issue Fee.**

Allowable Subject Matter

Claims 24-50 are is allowed.

Reason for Allowability

The following is an examiner's statement of reasons for allowance: the primary reason for the allowance is the including, in combination with other limitations recited in the independent claim and subsequential claims, the limitations of a polyphase reluctance machine comprising:

a first and second magnetic circuit assemblies arranged for relatively movement;
said first magnetic assembly having a plurality of first salient poles
said second magnetic assembly having a plurality of second salient poles;
wherein

widths of said first and second salient poles being substantially equal; and,
only said plurality of first salient poles carrying windings, each of said first salient poles of said first assembly is subdivided into plural teeth;

the windings for each of said first salient poles being mounted on either each of said teeth or on alternate teeth thereof, and all said windings of said teeth of each of said first salient poles being connected together to be one phase winding such that, when excited, *a phase winding of each pole forms electromagnetic poles of same polarity, each wound tooth being arranged, when in use, generating left and right circular flux loops such that a rotational direction of flux loop linkings to portions of on of a right loop and a left flux loop of respective adjacent wound teeth to be the same, and said flux loop linkings joining together as a series of circular flux loops, and an arrangement of said first and said second magnetic assemblies such that, when said machine being in used, at a position of a pole corner of said second salient poles of said second magnetic assembly is in alignment with said first salient poles of said first magnetic assembly, a flux loop produces a reluctance torque to move said salient poles, wherein said pole-corner of the second assembly being sequentially increasingly aligned with the pole of the first assembly by subsequent flux loops producing reluctance torque to continue move until said first and said second salient poles of said first and second assemblies are fully aligned.*

Comparing to the prior-art of the record, none of the prior art references of the record, either stand alone or in combination, has taught or suggest the above-mentioned features in combination with other limitations recited in the claims.

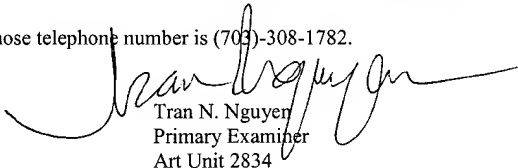
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N. Nguyen whose telephone number is (703) 308-1639. The examiner can normally be reached on M-F 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Burton Mullins can be reached on (703)-305-7063. The fax phone number for the organization where this application or proceeding is assigned is (703)-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-1782.



Tran N. Nguyen
Primary Examiner
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